

Claims:

1. Method to improve the handling characteristic of a vehicle in case of partially-braked driving, characterized by a driving stability regulation to correct or regulate deviations from a desired driving lane, which is designed in such a manner that the start of an activated and the end of an activated regulation situation occurs as a function of conditions which are determined based on straight-ahead driving conditions and cornering.
2. Method according to Claim 1, with the steps of detection of internal and external magnitudes and statuses, which represent the vehicle status parameters and the lane driving of the vehicle, detection of an activated regulation situation or the start of a regulation as a function of a straight-ahead driving condition or cornering, taking into account the internal and external magnitude and statuses, and correction and regulation of deviations from a desired driving lane by setting or modifying the adjusted braking pressure, when at least one threshold value is exceeded, which is determined based on the rotation above the vertical axis of the vehicle.
3. Method according to Claim 1 or 2, characterized in that the internal and external magnitudes are compared with threshold values, and an evaluation of the statuses occurs in such a manner that a determination is made whether the statuses of driving stability regulation are deactivated or not activated.
4. Method according to Claim 1, characterized in that the internal and external magnitudes and statuses, the driving angle (δ), the driving angle speed ($\dot{\delta}$), the braking pressure (p_{main}), the vehicle speed (v), the transverse inclination angle (α), the transverse acceleration (α_{actual}), the curve radius and regulation statuses of a vehicle stability regulation [sic].
5. Method according to Claim 1, characterized in that the threshold value is determined based on the straight-ahead driving condition or cornering.

6. Method according to Claim 3, characterized in that the threshold value of an ESP driving stability regulation is formed based on ESP driving stability criteria, and the threshold value (S_{ESP}), in case of a straight-ahead driving condition, is modified by means of a first, and, in case of cornering, by means of a second correction factor ($k_{STRAIGHT1}$ k_{CURVE2}).

7. Method according to one of Claims 1 to 4, characterized in that in the case of a partially-braked straight-ahead driving conditions, the start G_{in} of regulation occurs based on the relation $G_{in} = f(\delta, \dot{\delta}, p_{main}, v, \alpha)$ if one or more of the following conditions are satisfied:

ESP is not activated

ABS is not activated

Straight-ahead driving conditions have been detected.

8. Method according to Claim 7, characterized in that, in case of a partially-braked straight-ahead driving condition, the start of regulation occurs, if several of the following conditions are satisfied:

$$\delta < k \text{ degree}, \dot{\delta} < k_1 \text{ degree/s}, p_{main} > k_2 \text{ bar}, v > k_3 \text{ km/h},$$

$$\alpha < k_4 \text{ degree},$$

with the threshold values k to k_4 .

9. Method according to one of Claims 1 to 4, characterized in that in partially-braked cornering, the start K_{in} of regulation occurs according to the relation

$$K_{in} = f(\delta, \dot{\delta}, p_{main}, v, \alpha, a_{actual})$$

, if one or more of the following conditions are satisfied:

Curve is detected

Curve radius $> k_{10}$ m, preferably > 20 m

Oversteering not detected

ESP is not activated

ABS is not activated

10. Method according to Claim 9, characterized in that, in partially-braked cornering, the start of the regulation occurs, if several of the following conditions are satisfied:

$\delta < f(v)$ degree, $\dot{\delta} < k_5$ degree/s, $p_{main} > k_6$ bar, $v > k_7$ km/h,

$\alpha < k_8$ degree, $a_{actual} > k_9$ m/s²,

with the threshold values k_5 to k_9 and $f(v)$.

11. Method according to one of Claims 1 to 5, characterized in that, in partially-braked straight-ahead driving, the end of the correction or regulation of deviations from a desired driving lane occurs by setting or modifying the adjusted braking pressure, if at least one of the following conditions is satisfied

ESP is activated

ABS is activated

$\delta > k_{11}$ degree,

$\dot{\delta} > k_{12}$ degree/s,

with the threshold values k_{12} and k_{11}

12. Method according to Claim 11, characterized in that during partially-braked straight-ahead driving, the end of the activated regulation separation occurs, without any correction or regulation of deviations from a desired driving lane having occurred, if at least one of the following addition conditions is satisfied:

$\delta > k$ degree,

$\delta > k_1$ degree / s,

$p_{main} < k_2$ bar,

$v < k_3$ km / h,

$\alpha > k_4$ degree,

Straight-ahead driving conditions have not been detected.

13. Method according to one of Claims 1 to 4 or 6, characterized in that, during partially-braked cornering, the end of the correction or regulation of deviations from a desired driving lane by setting or modifying the adjusted braking pressure occurs, if at least one of the following conditions is satisfied:

ESP is activated

ABS is activated

$\delta > k_{12}$ degree / s.

14. Method according to Claim 12, characterized in that during partially-braked cornering the end of the activated regulation situation occurs, without a correction or regulation of deviations from a desired driving lane having taken place, if at least one of the following additional conditions is satisfied:

$\delta > f(v)$, that is the steering angle is greater than a threshold value which is dependent on the vehicle speed,

with linear interpolation between these reference place

$\delta > k_{13}$ degree / s,

$p_{main} < k_{14}$, optionally as a function of the transverse acceleration

$$v < k_{15} \text{ km/h},$$

$$\alpha > k_{16} \text{ degree},$$

$$\alpha_{actual} < k_{17} \text{ m/s}^2,$$

$$\text{Curve radius} < k_{17} \text{ m, preferably } < 20 \text{ m}$$

ESP is not activated, {ESP situation detection detects no cornering (constant or delayed)}

$$t_p > k_{18} \text{ s},$$

with the threshold values k_{13} and k_{18} and $f(v)$.

15. Method according to one of Claims 1 to 13, characterized in that no setting or modification of the braking pressure occurs, if the conditions according to Claims 7, 8 or 9, 10 have not been satisfied first.
16. Method according to one of Claims 1 to 10, characterized in that, the correction or regulation of deviations from the desired driving lane by setting or modifying the adjusted braking pressure occurs via a longitudinal force reduction by pressure decrease on at least one curve-interior wheel, preferably on the curve-interior back wheel.
17. Method according to Claim 15, characterized in that the pressure decrease occurs on both curve-interior wheels.
18. Method according to one of Claims 1 to 16, characterized in that the pressure difference which is set by the pressure decrease at the rear axle by the electronic brake force distribution (EBD) is maintained.

Summary

Method for improving the handling characteristic of a vehicle

The invention relates to a method for improving the handling characteristic of a vehicle during partially-braked driving, characterized by a driving stability regulation to correct or regulate deviations from a desired driving lane, which is designed in such a manner that the start of an activated and the end of an activated regulation situation occurs as a function of conditions which are determined based on straight-ahead driving conditions and cornering.